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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NIKOLAI MYKOLA IGNATYEV, URS WELZ-BIERMANN,
GERMAN BISSKY, HELGE WILLNER, and ANDRIY KUCHERYNA

Appeal 2010-010870
Application 10/594,966
Technology Center 1600

Before DEMETRA J. MILLS, MELANIE L. McCOLLUM, and STEPHEN WALSH, Administrative Patent Judges.

McCOLLUM, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a compound. The Examiner has rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

STATEMENT OF THE CASE

Claims 1, 3, 7, and 8 are on appeal (App. Br. 2).¹ We will focus on claim 1, the only independent claim on appeal, which is set forth in the Claims Appendix to the Appeal Brief (id. at 7). As stated by the Examiner, the elected species is N-butyl-N-methylpyrrolidinium pentafluoroethyl-trifluoroborate (Ans. 3).

Claims 1, 3, 7, and 8 stand rejected under 35 U.S.C. § 103(a) as obvious over Zhou² in view of MacFarlane³ (Ans. 3).

The Examiner relies on Zhou for teaching “1-ethyl-3-methyl-imidazolium pentafluoroethyltrifluoroborate as an ionic liquid” (id.).

The Examiner relies on MacFarlane for teaching “a family of ionic liquids based on organic salts of the dicyanamide anion” (id.). The Examiner finds: “The organic cation is generically taught to be quarternary ammonium, N-alkyl-N-methylpyrrolidinium, or 1-alkyl-3-methyl-imidazolium. 1-ethyl-3-methylimidazolium dicyanamide and N-butyl-N-methylpyrrolidinium dicyanamide are preferred embodiments. The disclosed salts have similar thermal behavior such as melting point, viscosity, water miscibility, etc. (see Table 1) which render them ionic liquids with similar properties.” (Id. at 3-4.)

¹ Claims 9-12 and 14-17 are also pending but have been withdrawn from consideration (App. Br. 1).

² Zhi-Bin Zhou et al., New hydrophobic ionic liquids based on perfluoroalkyltrifluoroborate anion, 125 J. FLUORINE CHEMISTRY 471-476 (2004).

³ Douglas R. MacFarlane et al., Low viscosity ionic liquids based on organic salts of the dicyanamide anion, CHEM. COMMUN. 1430-1431 (2001).

The Examiner concludes: “The disclosure of MacFarlane et al. establish[es] a functional equivalence between 1-ethyl-3-methylimidazolium and N-butyl-N-methylpyrrolidinium as organic cations. Thus, the combined disclosure of Zhou et al. and MacFarlane et al suggests to one of ordinary skill to make N-butyl-N-methylpyrrolidinium pentafluoroethyl-trifluoroborate.” (Id. at 4.)

Appellants argue the applied references do not suggest pairing pentafluoroethyltrifluoroborate with N-butyl-N-methylpyrrolidinium (App. Br. 3; Reply Br. 2). Appellants also argue that “[i]t was clearly not predictable that the electrochemical window of pyrrolidinium pentafluor[o]ethyltrifluor[o]borate (-3 to +4 as seen from Fig 1 of the present application) would be larger than the disclosed electrochemical window of 1-ethyl-3-methylimidazolium pentaflu[o]roethyl trifluoroborate (-2.5 to + 2.5: Fig. 4 of Zhou et al., page 474)” (App. Br. 3).

ISSUE

Does the evidence support the conclusion that it would have been obvious to pair pentafluoroethyltrifluoroborate, as disclosed in Zhou, with N-butyl-N-methylpyrrolidinium, as disclosed in MacFarlane?

ANALYSIS

We conclude that Appellants have the better position. In particular, we agree with Appellants that the Examiner has not adequately explained why the teaching in MacFarlane that various ionic liquids have similar properties, such as viscosity, suggests that each of the cations disclosed therein would be expected to be useful for forming an electrolyte, as disclosed in Zhou.

Furthermore, the Examiner has not adequately explained why Appellants' evidence concerning a larger electrochemical window does not overcome any *prima facie* case of obviousness. In particular, the Specification clearly states that the elected compound has high electrochemical stability (Spec. 4). In addition, we agree with Appellants that the evidence that this compound has higher electrochemical stability as compared to Zhou's compound, together with the evidence presented in the Rule 132 Declaration of record, indicating that this difference "is statistically significant" and is "an 'unexpected result'" (Dec. 1), overcomes any argument that the elected compound would have been obvious over Zhou in view of MacFarlane.

CONCLUSION

The evidence does not support the conclusion that it would have been obvious to pair pentafluoroethyltrifluoroborate, as disclosed in Zhou, with N-butyl-N-methylpyrrolidinium, as disclosed in MacFarlane. We therefore reverse the obviousness rejection of claim 1 and of claims 3, 7, and 8, which depend from claim 1.

REVERSED

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